SUPERMICRO®

SUPERSERVER 5013C-MT

USER'S MANUAL

Revision 1.0a

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5013C-MT. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5013C-MT is a high-end single processor 1U rackmount server based on the SC813MT-300C 1U rackmount server chassis and the Super P4SCT+ motherboard. The P4SCT+ supports a single Intel® Pentium® 4 processor of up to 3.40 GHz (processors must be 0.09 or 0.13 micron technology) and Intel® Celeron® processors of up to 2.80 GHz.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super P4SCT+ motherboard and the SC813MT-300C chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5013C-MT into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5013C-MT.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the P4SCT+ motherboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC813MT-300C 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: Software Installation

Appendix D: System Specifications

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Chapter 1
Introduction

1-1 Overview

The Supermicro SuperServer 5013C-MT is a high-end single processor, 1U rackmount server. The 5013C-MT is comprised of two main subsystems: the SC813MT-300C chassis and the P4SCT+ motherboard. The P4SCT+ supports a single 478-pin Intel Pentium 4 microPGA processor at up to 3.40 GHz with HT (hyper-threading) technology (or single a Intel Celeron processor of up to 2.80 GHz) and up to 4 GB of ECC or non-ECC unbuffered DDR400/333/266 SDRAM memory. Please refer to our web site for information on operating systems that have been certified for use with the 5013C-MT (www.supermicro.com) and for regular updates on supported processor speeds.

In addition to the motherboard and chassis, various hardware components may have been included with the 5013C-MT, as listed below.

- One CPU heatsink (SNK-P0002)
- One (1) slim CD-ROM drive
- Serial ATA (SATA) Accessories:
  One (1) internal SATA backplane (CSE-SATA-813)
  Four (4) SATA cables (CBL-0074)
  One (1) SATA LED cables (CBL-0069)
  Four (4) SATA drive carriers (CSE-PT39)
- One (1) 3.3V 64-bit, 66 MHz PCI-X slot riser card (CSE-RR1U-X)
- Rackmount hardware (with screws):
  Two (2) rack rail assemblies
  Six (6) brackets for mounting the rack rails in a rack/telco rack
- One (1) CD containing drivers and utilities
- SuperServer 5013C-MT User's Manual

1-2 Motherboard Features

At the heart of the SuperServer 5013C-MT lies the P4SCT+, a single processor motherboard designed to provide maximum performance. Below are the main features of the P4SCT+.

Chipset Overview

The P4SCT+ is based on Intel's E7210 chipset (see Figure 1-1 for a block diagram). The E7210 chipset is made up of two main components:

The Memory Controller Hub (MCH)

The I/O Controller Hub (6300ESB)

Memory Controller Hub (MCH)

The MCH controls the flow of data between the host (CPU) interface, the memory interface and the I/O Controller Hub interface. It contains advanced power management logic and supports dual-channel (interleaved) DDR memory, providing bandwidth of up to 6.4 GB/s using DDR400 SDRAM. The MCH supports configurations of a 800 MHz FSB with a 400/333 memory interface, a 533 MHz FSB with a 333/266 memory interface, and a 400 MHz FSB with a 266 MHz memory interface.
The MCH supports 128 MB, 256 MB, 512 MB, 1 GB, x4, x8, and x16 DDR. Maximum system memory supports up to 4.0 GB for dual-channel, ECC or Non-ECC unbuffered DDR. Registered and/or mixed-mode DIMMs are not supported. For more information, please refer to Chapter 5.

I/O Controller Hub (6300ESB)

The 6300ESB ICH provides the I/O subsystem with access to the rest of the system. It integrates a dual-channel Ultra ATA/100 bus master IDE controller, two Serial ATA (SATA) host controllers, the SMBus 2.0 controller, the LPC/Flash BIOS interface, the PCI-X (66MHz) 1.0 interface, the PCI 2.2 interface and the System Management Controller.

Processors

The P4SCT+ supports a single Intel® Pentium® 4 processor of up to 3.40 GHz with hyper-threading technology in a 478-pin microPGA socket (must be 0.09 or 0.13 micron technology) or single a Intel® Celeron® processor of up to 2.80 GHz. Please refer to the support section of our web site for a complete listing of supported processors (http://www.supermicro.com/support/).

Memory

The P4SCT+ has four (4) 184-pin DIMM sockets that can support up to 4 GB of ECC or non-ECC unbuffered DDR400/333/266 SDRAM modules. (Memory operates in a dual-channel, or interleaved configuration for increased performance.) Low-profile memory modules are required for use in the 1U form factor of the 5013C-MT. Module sizes of 128 MB, 256 MB, 512 MB and 1 GB may be used to populate the DIMM slots.

Serial ATA

A Serial ATA controller is incorporated into the E7210 chipset to provide a two-port Serial ATA subsystem.

PCI Expansion Slots

The P4SCT+ has two 32-bit, 33 MHz (5V) PCI slots and three 64-bit, 66 MHz (3.3V) PCI-X slots. When incorporated into the 5013C-MT server system, one 64-bit, 66 MHz PCI-X slot is available with the use of a riser card, which supports one full-height, full-length PCI card.

Ethernet Ports

The E7210 includes an on-chip Gb Ethernet controller and the P4SCT+ has an additional Gb Ethernet controller to support a total of two Gigabit LAN ports.

Onboard Controllers/Ports

An onboard IDE controller supports one floppy drive and up to four Ultra ATA 100 hard drives or ATAPI devices. Onboard I/O backpanel ports include one serial COM port, one parallel port, four USB ports, PS/2 mouse and keyboard ports and two GLAN (RJ45) ports.

Other Features

Other onboard features that promote system health include eight voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

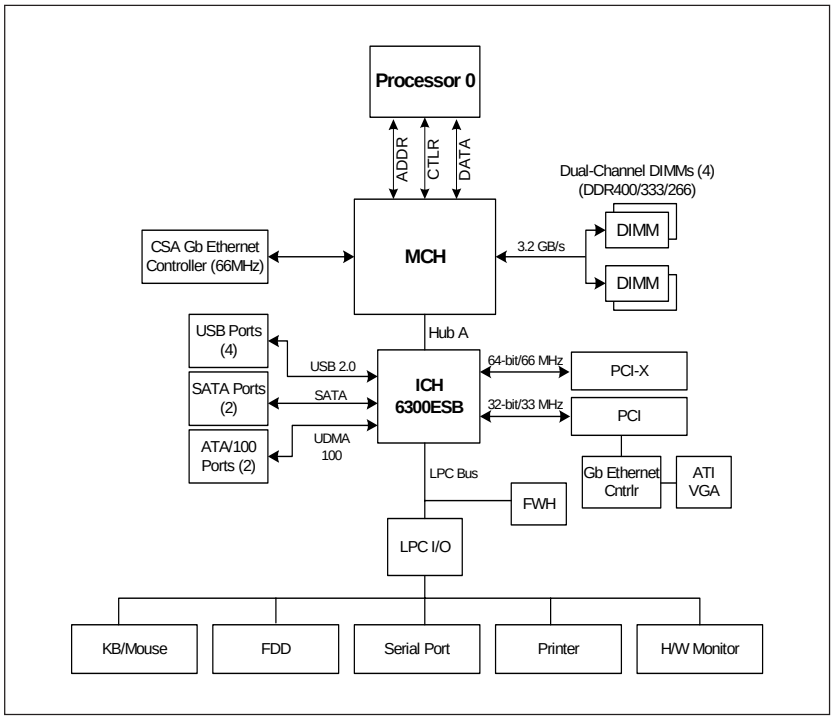


Figure 1-1 . Intel E7210 Chipset: System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.

1-3 Server Chassis Features

The SuperServer 5013C-MT is a 1U rackmount server platform configuration. The following is a general outline of the main features of the SC813MT-300C chassis.

System Power

When configured as a SuperServer 5013C-MT, the SC813MT-300C chassis includes a single 300W power supply.

Serial ATA Subsystem

The SC813MT-300C chassis was designed to support up to four Serial ATA hard drives. The Serial ATA drives are hot-swappable units. ATA/100 IDE drives are also supported.

Control Panel

The SC813MT-300C's control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and overheat conditions. The control panel also includes a main power button and a system reset button.

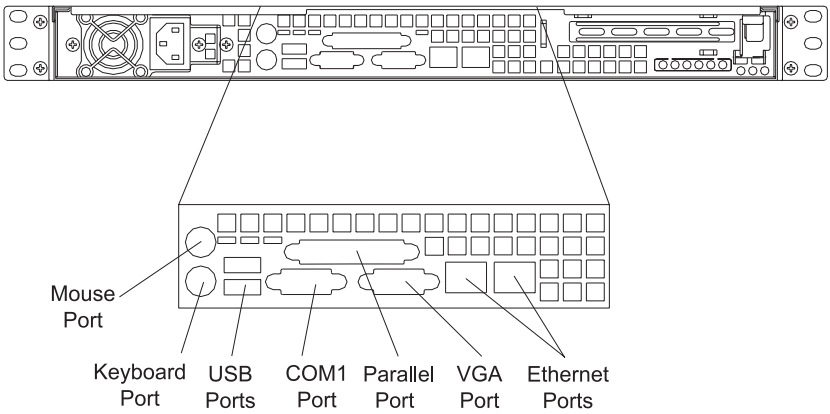
Rear I/O Panel

The rear I/O panel on the SC813MT-300C provides one motherboard expansion slot, one COM port (another is internal), two USB ports, PS/2 mouse and keyboard ports, a parallel (printer) port, a graphics port and two Gb Ethernet ports. (See Figure 1-2.)

Cooling System

The SC813MT-300C chassis has an innovative cooling design that features three 4-cm high performance cooling fans. The fans plug into headers on the motherboard and operates at full rpm continuously.

Figure 1-2. Rear I/O Panel



1-4 Contacting Supermicro

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Notes

Chapter 2
Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5013C-MT up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. This quick setup assumes that your 5013C-MT system has come to you with the processor and memory preinstalled. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the SuperServer 5013C-MT

You should inspect the box the SuperServer 5013C-MT was shipped in and note if it was damaged in any way. If the server itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 5013C-MT. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 5013C-MT was shipped in should include two sets of rail assemblies, six rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimal amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In a single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the power supply units and hot plug Serial ATA drive to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the 5013C-MT into a Rack

This section provides information on installing the SuperServer 5013C-MT into a rack unit. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the unit into a rack with the rack rails provided with the system. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

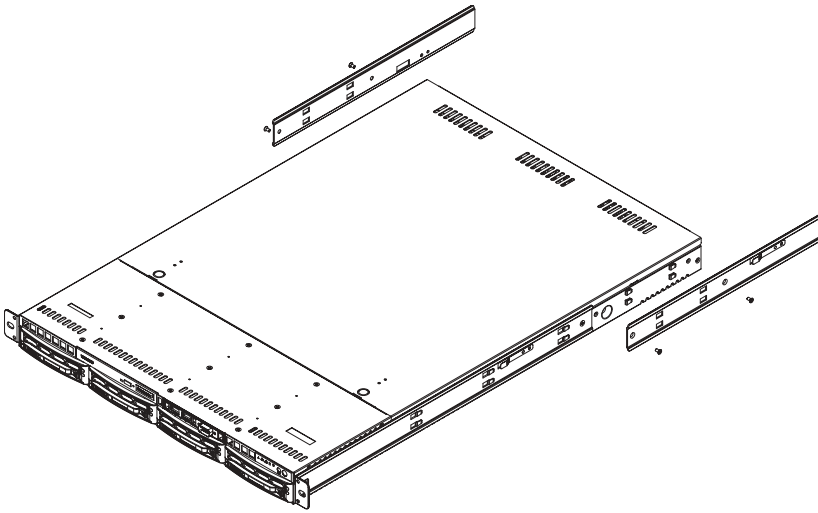
You may have received rack rail hardware with the SuperServer 5013C-MT. (Two front inner rails should already be attached to the chassis.) This hardware consists of two rear inner rails that secure to the chassis, one on each side just behind the preinstalled front inner rails. Note that these two rails are left/right specific.

Installing the Rear Inner Rails

First, locate the right rear inner rail (the rail that will be used on the right side of the chassis when you face the front of the chassis). Align the two square holes on the rail against the hooks on the right side of the chassis. Securely attach the rail to the chassis with M4 flat head screws. Repeat these steps to install the left rear inner rail to the left side of the chassis (see Figure 2-1). You will also need to attach the rail brackets when installing into a telco rack.

Locking Tabs: Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-1. Installing Rear Inner Chassis Rails



Installing the Rack Rails

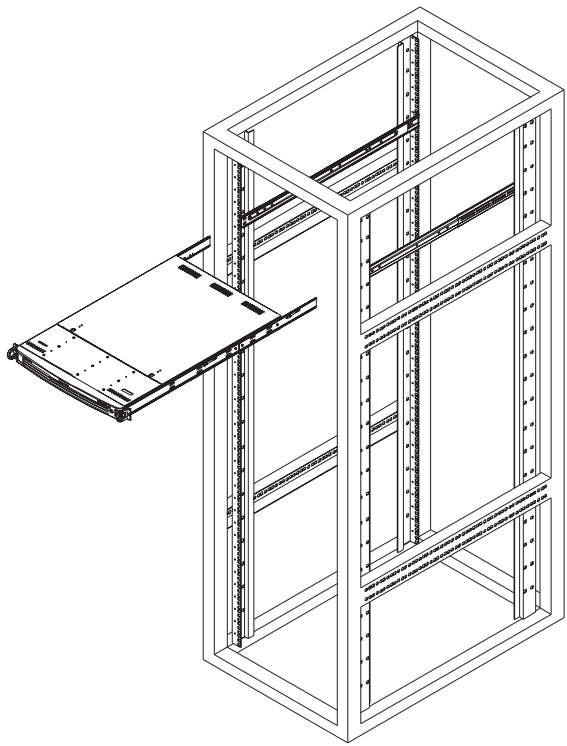
Determine where you want to place the SuperServer 5013C-MT in the rack (see Rack and Server Precautions in Section 2-3). Position the chassis rail guides at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure that both are at the exact same height and with the rail guides facing inward.

Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-2.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

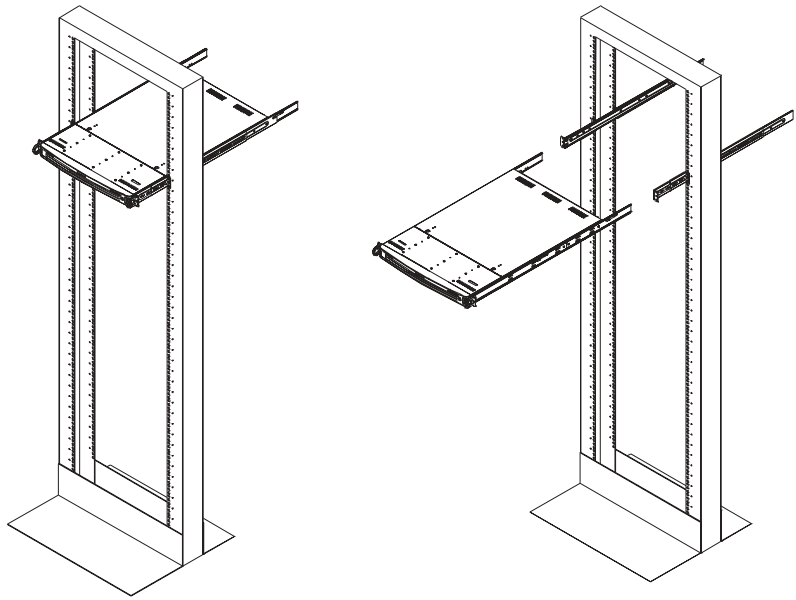
Figure 2-2. Installing the Server into a Rack (with optional front bezel shown)



Installing the Server into a Telco Rack

If you are installing the SuperServer 5013C-MT into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accomodate the width of the telco rack.

Figure 2-3. Installing the Server into a Telco Rack (with optional front bezel shown)



2-5 Checking the Motherboard Setup

After you install the 5013C-MT in the rack, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

1. **Accessing the inside of the 5013C-MT (Figure 2-4)**
   First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover while pushing the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

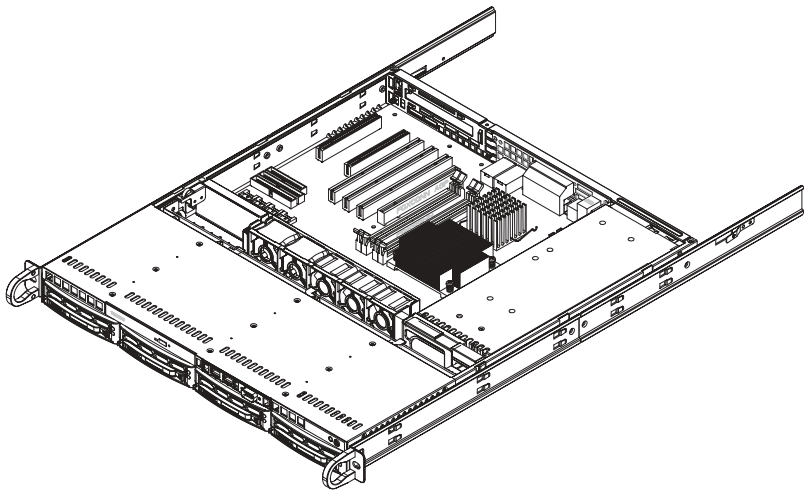
2. **Check the CPU (processor)**
   You may have one processor already installed into the system board. The processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

3. **Check the system memory**
   Your 5013C-MT server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. **Installing add-on cards**
   If desired, you can install an add-on card to the system. See Chapter 5 for details on installing a PCI add-on card.

5. **Check all cable connections and airflow**
   Make sure all power and data cables are properly connected and not blocking the airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the motherboard area of the chassis.
   Note: Make sure that the air seals are properly installed.

Figure 2-4.
Accessing the Inside of the SuperServer 5013C-MT



2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the Serial ATA drive and Serial ATA backplane have been properly installed and all essential connections have been made.

1. Accessing the drive bays

All drives can be accessed from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The Serial ATA disk drive can be installed and removed from the front of the chassis without removing the top chassis cover.

2. Installing a CD-ROM and floppy disk drives

Refer to Chapter 6 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

3. Check the Serial ATA disk drive

Depending upon your system's configuration, your system may have one Serial ATA drive already installed. If you need to install a Serial ATA drive, please refer to the appropriate section in Chapter 6.

4. Check the airflow

Airflow is provided by three 4-cm high performance fans. The system component layout was carefully designed to promote sufficient airflow through the small 1U rackmount space. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fan.

5. Supplying power to the system

The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

Chapter 3
System Interface

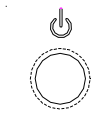
3-1 Overview

There are several LEDs on the control panel and one on the Serial ATA drive carrier to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-button buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

- **RESET:** The reset switch reboots the system.



- **POWER:** This is the main power switch, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC813MT-300C chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- **OVERHEAT:** Indicates an overheat condition in the chassis. This may be caused by cables obstructing the airflow in the system, or the ambient room temperature being too warm. You should also check to make sure that the chassis cover is installed and that all fans are present and operating normally. Finally, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the motherboard area of the chassis.

NIC2

- **NIC2:** Indicates network activity on GLAN2 when flashing .

NIC1

- **NIC1:** Indicates network activity on GLAN1 when flashing.

- **HDD:** Channel activity for all HDDs. This light indicates CD-ROM and SATA drive activity when flashing.

- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Serial ATA Drive Carrier LEDs

On the front of each Serial ATA drive carrier is a green LED. When illuminated, it indicates drive activity. A connection to the Serial ATA backplane enables this LED to blink on and off when that particular drive is being accessed.

Notes

Chapter 4
System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5013C-MT from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and CD-ROM drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Motherboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperServer 5013C-MT clean and free of clutter.

- The SuperServer 5013C-MT weighs approximately 38 lbs (17.3 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5013C-MT is operating to assure proper cooling. Out of warranty damage to the 5013C-MT system can occur if this practice is not strictly followed.

Chapter 5
Advanced Motherboard Setup

This chapter covers the steps required to install the P4SCT+ motherboard into the SC813MT-300C chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

5-1 Handling the P4SCT+ Motherboard

Electric-static discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the P4SCT+ motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electric Static Discharge (ESD).
- Touch a grounded metal object before removing any board from its anti-static bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their anti-static bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Motherboard Installation

This section explains the first step of physically mounting the P4SCT+ into the SC813MT-300C chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

1. Accessing the inside of the 5013C-MT (see Figure 2-5)

Two release buttons are located on the top cover of the chassis. Depressing both of these buttons while pushing the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. (If already installed in a rack, you must first release the retention screws that secure the unit to the rack. Then grasp the two handles on either side and pull the unit straight out until the rails lock into place.)

2. Check compatibility of motherboard ports and I/O shield:

The P4SCT+ requires a chassis big enough to support a 12" x 9.5" motherboard, such as Supermicro's SC813MT-300C 1U rackmount. Make sure that the I/O ports on the motherboard align properly with their respective holes in the I/O shield at the back of the chassis.

3. Mounting the motherboard onto the motherboard tray:

Carefully mount the motherboard to the motherboard tray by aligning the board holes with the raised metal standoffs that are visible on the bottom of the chassis. Insert screws into all the mounting holes on your motherboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the motherboard ground to provide a continuous ground for the system.

5-3 Connecting Cables

Now that the motherboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-10 for connector locations.)

- IDE Device cable (J5)
- Serial ATA Device cables (JS1, JS2, JS3 and JS4)
- Serial ATA active LED cable (JS9)
- Control Panel cable (JF1)

Connecting Power Cables

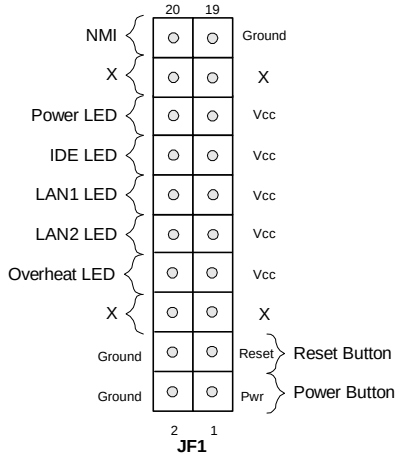
The P4SCT+ has a 24-pin primary power supply connector ("ATX Power") at J20 for connection to the ATX power supply. In addition, there is a 4-pin secondary power connector at J21 that also must be connected to your power supply. See Chapter 5 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

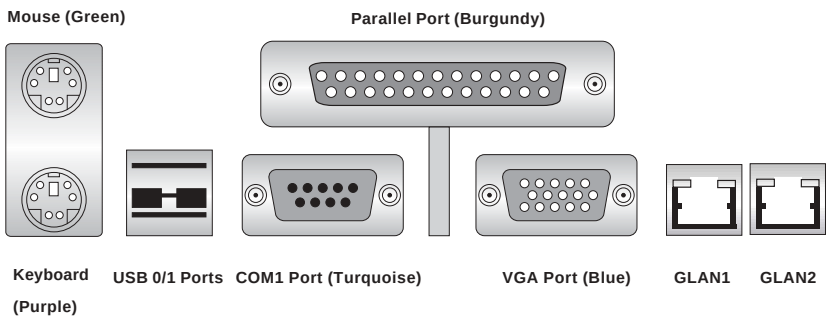
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Port Locations



Note: The COM2 port is a header on the motherboard, located near the ATX power connector.

5-5 Installing Processors

Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

Processor Support

The P4SCT+ has a single 478-pin microPGA socket, which supports Intel Pentium 4 processors on .013 micron process.

1. Lift the lever on the CPU socket.

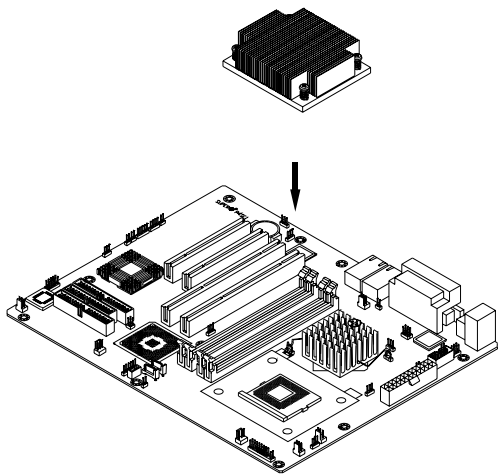
2. Install the CPU in the socket. Make sure that Pin 1 of the CPU is seated on Pin 1 of the socket (both corners are marked with a triangle).

3. Press the lever down until you hear it *click* into the locked position.

4. Apply the proper amount of thermal compound to the CPU die. Place the heatsink on top of the CPU aligning its holes with those on the retention mechanism. Screw in two diagonal screws (ie. the #1 and #2 screws) until just snug, then do the same with the remaining two screws. Finish by fully tightening all four screws (see Figure 5-4 on next page).

Figure 5-3. 478-pin Socket: Empty and with Processor Installed

Figure 5-4. Heatsink (SNK-P0002) Installation



5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

1. Memory support

The P4SCT+ supports 4 GB of dual-channel, ECC or non-ECC unbuffered DDR-400/333/266 SDRAM. You **must** populate both DIMM0A and DIMM1A and/or DIMM0B and DIMM1B with the same size and type of memory modules. This will result in dual channel (two-way interleaved) operation, which is faster than single channel operation.

2. Installing memory modules

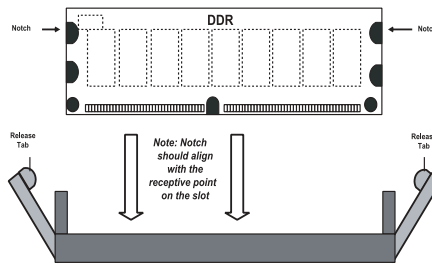
Insert each memory module vertically. Pay attention to the notch along the bottom of the module to prevent inserting it incorrectly. Gently press down on the DIMM module until it snaps into place in the slot (see Figure 5-5).

Memory Speeds

Host Clock (MHz)	FSB (MHz)	DRAM Data (MT/s)	Shown during POST
100	400	266	DDR266
		333	DDR266
		400	DDR266
133	533	266	DDR266
		333	DDR333
		400	DDR333
200	800	266	DDR266
		333	DDR320*
		400	DDR400

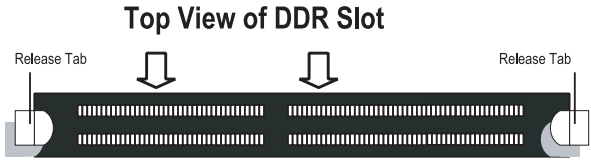
* The BIOS displays DDR320 due to a chipset limitation.

Figure 5-5. DIMM Installation



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Figure 5-6. Top View of DIMM Slot



5-7 Adding PCI Cards

1. 64-bit PCI-X slot

The 5013C-MT comes with a riser card that supports one standard size 64-bit, 66 MHz PCI-X (3.3V) card. This riser card allows a single PCI-X card to sit at a 90 degree angle so it can fit inside the chassis.

2. PCI card installation

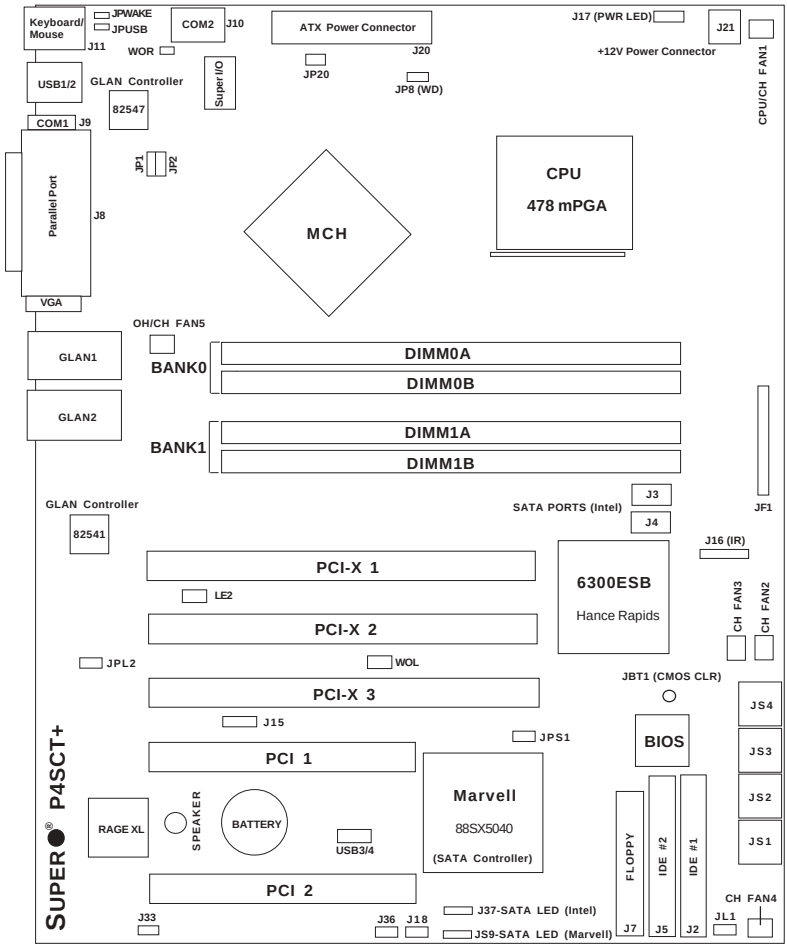
The system should be powered down when adding or removing PCI cards. Begin by removing the top cover of the chassis. You will see a metal enclosure that houses the riser card. Remove this housing by lifting the two plastic levers at either end and pulling the housing up and out of the chassis. The riser card is attached to the inside top of the housing. Release the latch that secures the PCI slot I/O shields to the housing by pulling it away from the housing. Remove the shield and insert a PCI-X card into the slot on the riser card, pushing down with your thumbs evenly on both sides of the card. After the card has been added, push the latch back into position. Replace the housing in the serverboard making sure the plastic levers properly catch on the chassis, then push them down to lock the housing in place. Finish by replacing the top chassis cover and powering up the system.

Note: The PCI slot I/O shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering the slot.

5-8 Motherboard Details

Figure 5-7. P4SCT+ Layout

(not drawn to scale)



Jumpers not indicated are for test purposes only.

P4SCT+ Quick Reference

Jumpers	Description	Default Setting
J18	Speaker	Pins 3-4 (Int. Buzzer)
J33	VGA Enable/Disable	Pins 1-2 (Enabled)
J36	Keylock Header	Open (Disabled)
JBT1	CMOS Clear	See Section 5-10
JP1/JP2	CPU Clock Speed	Pins 1-2 (Auto)
JP8	Watch Dog Reset	Pins 1-2 (WD Reset)
JP20	Power Force On	Open (Disabled)
JPL2	GLAN2 Enable/Disable	Pins 1-2 (Enabled)
JPS1	JS1-4 SATA En/Dis	Pins 1-2 (Enabled)
JPUSB	USB1/2 Wake Up En/Dis	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake Up	Pins 1-2 (Disabled)

Connectors	Description
DIMM0A/0B/1A/1B	Memory (DIMM) Slots
Fans 1-5	CPU/CH Fan1, CH Fan2, 3, 4, OH Fan/CH Fan 5
GLAN1/2	Gigabit LAN Ports
J2/J5	IDE1/2 Ports
J3/J4	SATA Connectors 1/2 (Intel Controller)
J7	Floppy Disk Drive Connector
J8	Parallel Printer Port
J9/J10	COM1(J9), COM2(J10)
J11	Keyboard/Mouse Connector
J15	System Management Bus
J16	Infrared Header
J17	Power LED
J20	ATX Power Connector
J21	+12V Power Connector
J36	Keylock Connector
J37	SATA LED Header (Intel ports)
JF1	Front Control Panel
JL1	Chassis Intrusion Header
JP17	Power LED
JS1-4	SATA Connectors 1-4 (Marvell Controller)
JS9	SATA LED Header (Marvell ports)
USB 1/2	Backpanel Universal Serial Ports 1/2
USB 3/4	Universal Serial Ports 3/4 (for front side access)
WOL	Wake-On-LAN
WOR	Wake-On-Ring Header

5-9 Connector Definitions

Power Supply Connectors

The primary power supply connector on the P4SCT+ meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. You must also connect the 4-pin J21 power connector to your power supply. Refer to the table below right for the J24 (12V) connector.

Important: you must connect J21 to your power supply to meet the ATX safety requirements.

ATX Power Supply 24-pin Connector Pin Definitions

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

+12V 4-pin PWR Connector (J21)

Required Connection

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

PW_ON Connector

The PW_ON connector is located on pins 1 and 2 of JF1. This header should be connected to the chassis power button, which you may also configure to put the system into suspend mode (see the Power Button Mode setting in BIOS). To turn off the power when the suspend mode is enabled, depress the power button for at least 4 seconds. See the table on the right for pin definitions.

PW_ON Pin Definitions (JF1)

Pin Number	Definition
1	PW_ON
2	+3V

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Pin Definitions (JF1)

Pin Number	Definition
3	Reset
4	Ground

Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (JF1)

Pin Number	Definition
7	Vcc
8	GND

GLAN2 LED

The GLAN2 LED connection is located on pins 9 and 10 of JF1. Attach the GLAN2 LED cable to display GLAN2 activity. Refer to the table on the right for pin definitions.

GLAN2 LED Pin Definitions (JF1)

Pin Number	Definition
9	Vcc
10	GND

GLAN1 LED

The GLAN1 LED connection is located on pins 11 and 12 of JF1. Attach the GLAN1 LED cable to display GLAN1 activity. Refer to the table on the right for pin definitions.

GLAN1 LED Pin Definitions (JF1)

Pin Number	Definition
11	Vcc
12	GND

IDE LED

The IDE LED is located on pins 13 and 14 of JF1. This LED is used to display all IDE and SATA activity on all drives. See the table on the right for pin definitions.

IDE Activity LED Pin Definitions (JF1)

Pin Number	Definition
13	+5V
14	HD Activity

Power_LED Connector

The Power LED connector is located on pins 15 and 16 of JF1 (or you may use J17 for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

PWR_LED Pin Definitions (JF1)

Pin Number	Definition
15	Vcc
16	Control

J17 Pin Definitions

Pin Number	Definition
1	+5V
2	Key
3	Ground

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin Number	Definition
19	Ground
20	Control

SMB Header

A System Management Bus header is located at J15. Connect the appropriate cable here to utilize SMB on your system.

SMB Header Pin Definitions (J15)

Pin Number	Definition
1	Data
2	Ground
3	Clock
4	No Connection

IR Connector

The infrared connector is located on J16. See the table on the right for pin definitions. See the Technical Support section of our web page for information on the infrared devices you can connect to the system.

Infrared Pin Definitions (J16)

Pin Number	Definition
1	+5V
2	CIRRX
3	IRRX
4	Ground
5	IRTX
6	NC

Serial Ports

Two serial ports are included on the motherboard: COM1 is a port located beside the mouse/keyboard ports and COM2 is a header located on the motherboard near the J20 power connector. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port. NC indicates no connection.

Fan Headers

There are six fan headers on the P4SCT+, which are designated CPU/ Chassis Fan1, Chassis Fan2, Chassis Fan3, Chassis Fan4 and OH (Overheat)/Chassis Fan5. (Chassis Fan 3 and Chassis Fan 4 are not monitored by BIOS.) Connect the fan on your CPU heatsink to the CPU/Chassis Fan1 header. See the table on the right for pin definitions.

Fan Header Pin Definitions (CPU/ Chassis and Overheat)

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: These fan headers are DC power.

Chassis Intrusion

The Chassis Intrusion header is designated JL1. See the board layout in Chapter 1 for the location of JL1 and the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

Wake-On-LAN

The Wake-On-LAN header is designated WOL on the motherboard. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this function. (You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.)

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated WOR. This function allows your computer to receive and be "awakened" by an incoming call when in the suspend state. See the table on the right for pin definitions. You must also have a WOR card and cable to use this feature.

Wake-On-Ring Pin Definitions (WOR)

Pin Number	Definition
1	Ground
2	Wake-up

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J11. The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J11)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Universal Serial Bus (USB)

There are two Universal Serial Bus ports located on the I/O panel and an additional two USB headers located on the motherboard. These headers, labeled USB3/4, can be used to provide front side chassis access (cables not included). See the tables on the right for pin definitions.

USB1/2 Pin Definitions

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

USB3/4 Pin Definitions

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground

GLAN1/2 (Ethernet) Ports

Two Ethernet ports (designated GLAN1 and GLAN2) are located beside the VGA port on the IO backplane. These ports accept RJ45 type cables.

SATA LED (Marvell)

The SATA LED header located on JS9 is used to display all SATA activity on the JS1-JS4 SATA ports (Marvell SATA controller). See the table on the right for pin definitions.

SATA LED Pin Definitions (JS9)

Pin #	Definition	Pin #	Definition
1	SATA1	6	NC
2	SATA2	7	NC
3	SATA3	8	NC
4	SATA4	9	NC
5	SATA LED Comm	10	Key

SATA LED (Intel)

The SATA LED header located on J37 is used to display all SATA activity on the J3 and J4 SATA ports (Intel SATA controller). See the table on the right for pin definitions.

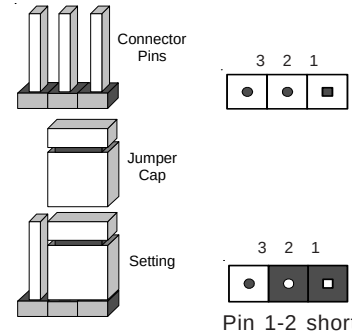
Intel's SATA LED Pin Definitions (J37)

Pin Number	Definition
1	(I-)SATA1
2	(I-)SATA2
3	NC
4	NC
5	NC

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.



Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.

CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS, 1) First unplug the power cord(s) 2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver 3) Remove the screwdriver (or shorting device) 4) Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS.*

Front Side Bus Speed

JP1 and JP2 are used to set the system (front side) bus speed for the processors. It is best to keep these jumpers set to Auto. These jumpers are used together with the CPU Clock setting in BIOS. See the table on the right for jumper settings.

Front Side Bus Speed (JP1, JP2)

JP1	JP2	FSB Speed
Pins 1-2	Pins 1-2	Auto
Pins 2-3	Pins 2-3	100 MHz (x4)
NC	Pins 2-3	133 MHz (x4)
NC	NC	Reserved
Pins 2-3	NC	200 MHz (x4)

Note: NC stands for "No Connection".

USB Wake-Up

Use JPUSB1 to enable or disable USB Wake-Up, which allows you to wakeup the system by depressing a key on the keyboard or by clicking the mouse when either is connected to the USB1 or USB2 port. Enable the jumper to allow the system to be woken up from an S1 or S3 state in Windows OS. See the table on the right for jumper settings. This feature works with the USB1 and USB2 ports only.

USB Wake-Up Jumper Settings (JPUSB1)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Watch Dog Enable/Disable

JP8 enables controls the Watch Dog function, a system monitor that takes action when a software application freezes the system. Pins 1-2 will have WD reset the system if a program freezes. Pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings (JP8)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

Note: when Watch Dog is enabled, the user must write their own application software to disable the Watch Dog Timer.

Speaker Jumper

The speaker jumper is located on J18 and allows you to choose between using the internal or external speakers. For the internal speaker, jump pins 3 and 4. To use an external speaker, place the speaker cable's header on all four pins See the table on the right.

Speaker Jumper Settings (J18)

Pins	Definition
1 through 4	External Spkr
3 and 4	Internal Spkr

Keyboard Wake-Up

The JPWAKE jumper is used to allow the system to be woken up by depressing a key on the keyboard from an S1 or S3 state in Windows OS. See the table on the right for jumper settings. Your power supply must meet ATX specification 2.01 or higher and supply 720 mA of standby power to use this feature.

Keyboard Wake-Up Jumper Settings (JPWAKE)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

GLAN2 Enable/Disable

Change the setting of jumper JPL2 to enable or disable the onboard GLAN2 port on the motherboard. See the table on the right for jumper settings. The default setting is Enabled. (For LAN1, please change the setting in the BIOS.)

GLAN2 Enable/Disable Jumper Settings (JPL2)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

VGA Enable/Disable

J33 allows you to enable or disable the VGA port. The default position enabled. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (J33)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

Keylock Enable/Disable

The Keylock header is located at J36. Close the jumper to enable the Keylock function and leave the jumper open (off) to disable it. The default setting is open. See the table on the right for jumper settings.

Keylock Enable/Disable Jumper Settings (J36)

Jumper Position	Definition
On	Enabled
Off	Disabled

SATA Enable

JSP1 is used to enable or disable Marvell's Serial ATA Controller. See the table on right for pin definitions.

SATA Enable/Disable
Jumper Settings (JPS1)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

5-11 Onboard Indicators

Standby Power LED

The Standby Power LED indicator is designated LE2. When the Standby PWR LED is on, it indicates the system standby power is on.

5-12 Parallel Port, Floppy and Hard Drive Connections

Use the following information to connect the floppy and hard disk drive cables.

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.
- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Parallel Port Connector

The parallel port is located on J8. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions (J8)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Floppy Connector

The floppy connector is located on J7. See the table on the right for pin definitions.

Floppy Connector Pin Definitions (J7)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Connectors

There are no jumpers to configure the onboard IDE interfaces J2 and J5. See the table on the right for pin definitions. You must use the ATA100/66 cable included with your system to benefit from the ATA100/66 technology.

IDE Connector Pin Definitions (J2, J5)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

Chapter 6
Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC813MT-300C chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required

The only tool you will need to install components and perform maintainance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

Precautions

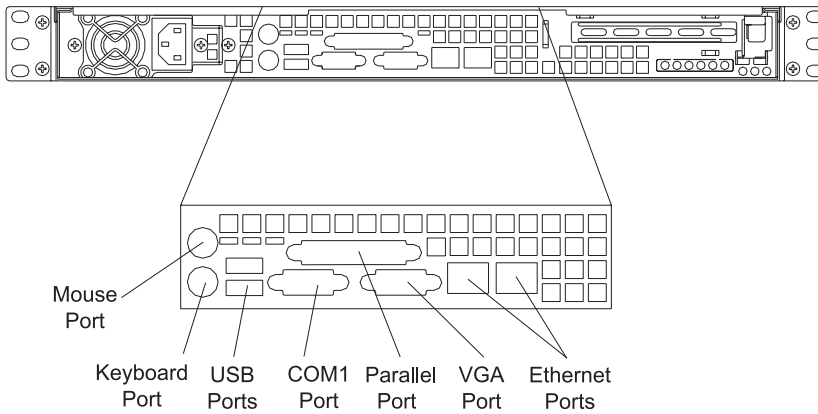
- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Chassis Front View

Figure 6-2. Chassis Rear View



6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system control buttons and status indicators. These wires have been bundled together in a ribbon cable to simplify the connection. Connect the cable from JF1 on the motherboard to JP4 on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both JF1 and JP4. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

6-3 System Fans

Three 4-cm high-performance fans provide the cooling for the SuperServer 5013C-MT. The chassis includes air seals under the fans and at the chassis cross section, which separates the drive bay area from the motherboard area of the chassis to promote better airflow. It is highly important that the air seal is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis.

System Fan Failure

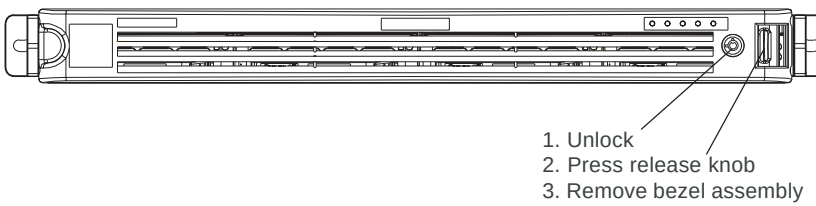
The fans run at a full 100% rpm. If a fan fails, you will need to have it replaced with the same type. Contact your vendor or Supermicro for information on replacement fans.

6-4 Drive Bay Installation/Removal

Removing the Front Bezel

If your system has a front bezel (optional) attached to the chassis, you must first remove it to gain access to the drive bays. To remove the bezel, first unlock the front of the chassis then press the release knob (see Figure 6-3). Carefully remove the bezel with both hands. A filter located within the bezel can be removed for replacement/cleaning. It is recommended that you keep a maintenance log of filter cleaning/replacement, since its condition will affect the airflow throughout the whole system.

Figure 6-3. Removing the Front Bezel



Accessing the Drive Bays

Serial ATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace Serial ATA drives. Proceed to the next step for instructions.

CD-ROM Drive: For installing/removing a CD-ROM drive, you will need to gain access to the inside of the 5013C-MT by removing the top cover of the chassis. Proceed to the "CD-ROM Drive Installation" section later in this chapter for instructions.

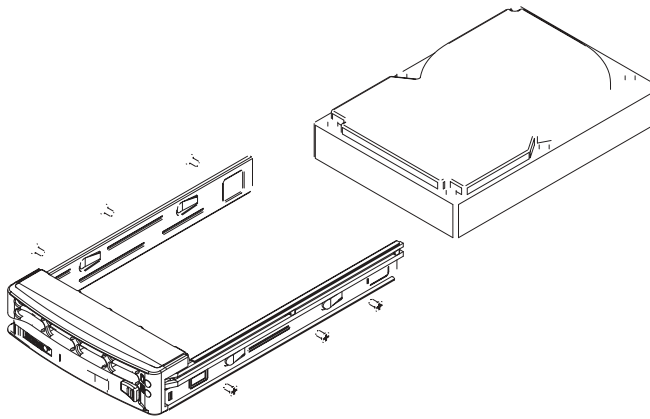
Note: Only a "slim" CD-ROM drive will fit into the 5013C-MT.

Serial ATA Drive Installation

1. Mounting a Serial ATA drive in a drive carrier

The Serial ATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the Serial ATA drive bays. For this reason, even empty carriers without Serial ATA drives installed must remain in the chassis. To add a new Serial ATA drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with six screws (see Figure 6-4).

Figure 6-4. Mounting a Drive in a Carrier



Use caution when working around the Serial ATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

2. Installing/removing hot-swap Serial ATA drives

Four Serial ATA drive bays are located in the front of the chassis, making them easily accessible for installation and removal. These drives are hot-swappable, meaning they can be installed and removed without powering down the system. To remove, first push the release button located beside the drive LEDs, then swing the handle fully out and use it to pull the unit straight out.

<u>Important:</u> The Serial ATA drive carrier must remain in the drive bays to maintain proper airflow.

Serial ATA Power Cables

Serial ATA power cables should be routed so that they do not block the airflow through the chassis. See the motherboard layout diagram for the location of the cable connections.

Serial ATA Backplane

The Serial ATA drives plug into a backplane that provides power, drive ID and bus termination. A RAID controller can be used with the backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the Serial ATA drives. The backplane is already preconfigured, so there are no jumpers or switches present on it.

CD-ROM Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM drive bay. The 5013C-MT accomodates only slim CD-ROM drives. Side mounting brackets are needed to mount a slim CD-ROM drive in the 5013C-MT server.

You must power down the system before installing or removing a CD-ROM drive. First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

With the chassis cover removed, unplug the power and data cables from the drive. Then locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis. Pull the tab away from the drive and push the drive unit out the front of the chassis. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system.

6-5 Power Supply

The SuperServer 5013C-MT has a single 300 watt power supply. This power supply has the capability of operating at 100 or 240 input volts. Depress the main power button on the front of the chassis and then unplug the AC power cord to completely remove power from the system before removing the power supply.

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro (PWS-0054 - see contact infomation in Chapter 1).

Replacing the Power Supply

1. Accessing the inside of the SuperServer 5013C-MT

To replace a power supply, you must first remove the top chassis cover. To do so, first release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and push it away from you. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. Removing the power supply

First unplug the power cord from the system. To remove the failed power unit, remove the two screws on the back of the power supply, which secure it to the chassis. You can then lift the unit straight out of the chassis. (The power cord should have already been removed.)

3. Installing a new power supply

Replace the failed unit with another unit of the same wattage. It is highly recommended to replace it with the exact same power supply. Carefully insert the new unit into position in the chassis and secure it with the two screws at the rear of the unit. Before reconnecting the power cord, make sure the power switch on the power supply is in the off position. Then reconnect the power cord, replace the chassis top cover and push the unit back into the rack. Finish by turning the power switch on the power supply on, and then depress the power button on the front of the system.

Notes

Chapter 7
BIOS

7-1 Introduction

This chapter describes the AwardBIOS for the P4SCT+. The Award ROM BIOS is stored in a Flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Refer to the Manual Download area of our web site for any changes to BIOS that are not reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The AwardBIOS Flash chip stores the system parameters, such as amount of memory, type of disk drives and video displays, etc. CMOS requires very little power. When the computer is turned off, a back-up battery provides power to the BIOS Flash chip, enabling it to retain the system parameters. Each time the computer is powered-on, the computer is then configured with the values stored in the BIOS ROM by the system BIOS, which gains control when the computer is powered on.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Chipset and Power menus. Section 4-3 gives detailed descriptions of each parameter setting in the Setup utility.

7-2 Running Setup

Optimal default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the Main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the AwardBIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after turning the system on, or
2. When the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Del> key to activate the Main Setup Menu.

Press DEL to enter SETUP

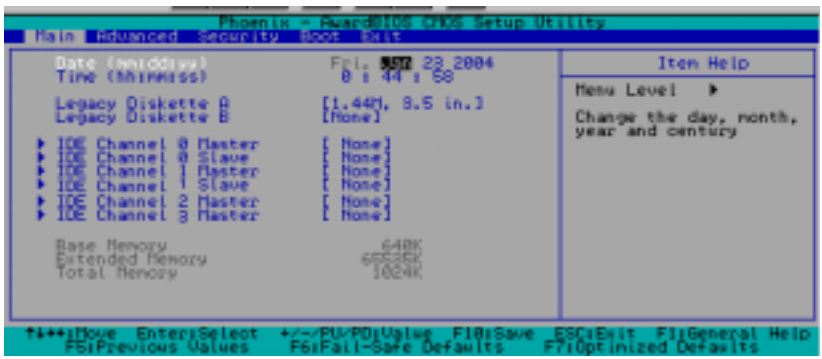
7-3 Main BIOS Setup

All Main Setup options are described in this section. The Main BIOS Setup screen is displayed below.

Use the <Up> <Down> arrow keys or the <Tab> key to move among the different settings in the above menu.

Press the <Esc> key to exit the CMOS Setup Menu and use the <Left> <Right> arrow keys to enter the other categories of BIOS settings. The next section is described in detail to illustrate how to navigate through the menus.

Main BIOS Setup Menu


Phoenix - AwardBIOS CMOS Setup Utility
Main Advanced Security Boot Exit
Item Help
Menu Level ▶
Change the day, month, year and century
Legacy Diskette A [1.44M, 3.5 in.]
Legacy Diskette B [None]
IDE Channel 0 Master [None]
IDE Channel 0 Slave [None]
IDE Channel 1 Master [None]
IDE Channel 1 Slave [None]
IDE Channel 2 Master [None]
IDE Channel 3 Master [None]
Base Memory 640K
Extended Memory 65536K
Total Memory 1024K
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Date/Time

Set the system date and time. Key in the correct information in the "mm", "dd" and "yy" fields. Press the "Enter" key to save the data.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are "None", "360Kb, 5.25 in", "1.2MB, 5.25 in", "720Kb, 3.5 in", **"1.44 MB, 3.5 in"**, and "2.88MB 3.5 in".

Legacy Diskette B

This setting allows the user to set the type of floppy disk drive installed as diskette B. The options are **"None"**, "360Kb, 5.25 in", "1.2MB, 5.25 in", "720Kb, 3.5 in", "1.44 MB, 3.5 in", and "2.88MB 3.5 in".

▶IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master

These settings allow the user to set the parameters of the IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the sub-menu screen for detailed options of these items. Set the correct configurations accordingly.

IDE HDD Auto-Detection

This option allows the user to determine the manner in which the AwardBIOS sets the settings for the IDE Primary Master Device. The options are "None", "**Auto**" and "Manual."

IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master

Press the <Auto> key to activate the function of 'IDE HDD Auto-Detection", which will allow the BIOS to automatically detect the status of the IDE HDD installed in the system, such as the size, the number of cylinders, the configurations of items such as Head, Precomp, Landing Zone and Sector. The options are "None", "**Auto**", and "Manual."

Access Mode

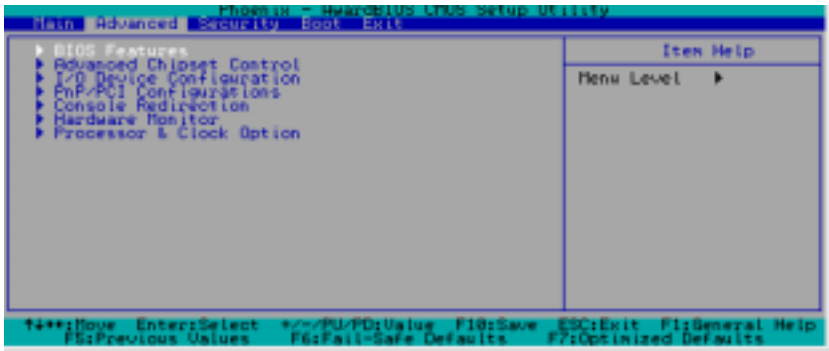
This item determines the location through which the AwardBIOS accesses the IDE Primary Master Device. The settings are "CHS", "LBA", "Large", and "**Auto**".

Base Memory/Extended Memory/Total Memory

These are displays that inform you how much of each type of memory is recognized as being present in the system.

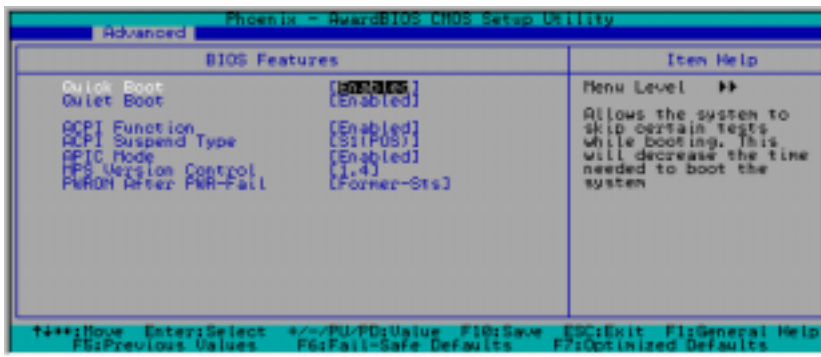
7-4 Advanced BIOS Setup

Choose Advanced BIOS Setup from the Award BIOS main menu with the Left/ Right arrow keys. You should see the following display. Select one of the items in the left frame of the screen to go to the sub screen for that item. Advanced BIOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced BIOS Setup options are described in this section.



7-4.1 Advanced BIOS Features

When the item of Advanced BIOS Features is highlighted, press the <Enter> key to activate the screen below:


Phoenix - AwardBIOS CMOS Setup Utility
Advanced
BIOS Features
Item Help
Quick Boot [Enabled]
Quiet Boot [Enabled]
ACPI Function [Enabled]
ACPI Suspend Type [S1(POS)]
APIC Mode [Enabled]
MPS Version Control [1.4]
PCIROM After PWR-Fail [Former-Sts]
Menu Level
Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Quick Boot

If enabled, this feature allows the system to skip certain tests while booting. This will decrease the time needed to boot the system. The settings are "**Enabled**" and "Disabled".

Quiet Boot

This feature allows the user to activate the function of "Quiet Boot". The options are: "**Enabled**" and "Disabled".

ACPI Function

Select "Enabled" to activate the function of BIOS Support for Advanced Configuration and Power Interface features. The settings are "**Enabled**" or "Disabled".

ACPI Suspend Type

If enabled, the option allows the user to determine the ACPI Suspend type. The options are **"S1(POS)"**, "S3(STR)", and S1&S3.

APIC Mode

This setting allows you to **Enable** or Disable APIC. APIC is used to assign interrupt signals to a specific processor on multi-processor system and provides IRQs beyond the conventional 16 under Windows 2000 or XP. It has no effect on single processor systems.

MPS Version Control

This setting allows you to state the MPS version for your operating system. Options are "1.1" and "**1.4**".

PWRON After PWR-Fail

This setting allows the user to specify how the system will respond when power is reapplied after the system has gone down due to a power failure. The options are "**Off**", "On" and "Former-Sts (Former Status)".

7-4.2 Advanced Chipset Control

Access the submenu to make changes to the following settings.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced
Advanced Chipset Control
Item Help
ECC Config [Enabled]
CSA LAN (Bias-LAN) [Enabled]
SmartFanControl [Disabled]
*** On-Chip Serial ATA Setting ***
SATA Mode [IDE]
On-Chip Serial ATA [Auto]
Serial ATA Port0 Mode [Primary Master]
Serial ATA Port1 Mode Primary Master
USB Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Legacy Support [Disabled]
x USB KB Wake-Up From S3 Disabled
CPU THRM-Throttling [75.0%]
Menu Level ▸▸
This setting lets you enable or disable ECC
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

ECC Configuration

This setting allows you to enable or disable ECC (Error Correction and Checking). The options are **"ECC"** and "Non-ECC".

CSA LAN (Giga-LAN)

Select "Enabled" to activate the function of CSA LAN. The options are **"Enabled"** and "Disabled".

Smart Fan Control

Select "Enabled" to enable the function of Smart Fan Control. The options are **"Disabled"** and "Enabled".

SATA Mode

This setting allows you to set the SATA Mode RAID via BIOS. The options are **"RAID"** and "IDE".

On-Chip Serial ATA

This setting allows you to configure On-Chip Chipset Configurations. Select "Disabled" to disable SATA controller. If "Auto" is selected, BIOS will automatically configure the settings for SATA controller. Select "Combined Mode" to combine the functionality of Parallel ATA (PATA) and Serial ATA(SATA) (* with the maximum of two IDE drives available for each channel.) If "Enhanced Mode" is selected, both SATA and PATA are supported (*with the maximum of 6 IDE drives available.) If "SATA Only" is selected, SATA will operate in the Legacy Mode. The options are Disabled, **Auto,** Combined Mode, Enhanced Mode, and SATA only.

Serial ATA Port0/1 mode

This setting allows you to configure Serial ATA Port0/1 modes. The options are **Primary Master**, Primary Slave, Secondary Master, Secondary Slave, SATA0 Master and SATA1 Master.

USB Controller

This setting allows you to enable or disable the USB Controller. The options are **Enabled**, and Disabled.

USB 2.0 Controller

This setting allows you to enable or disable USB 2.0 (EHCI) Controller. The options are **Enabled**, and Disabled.

USB Legacy Support

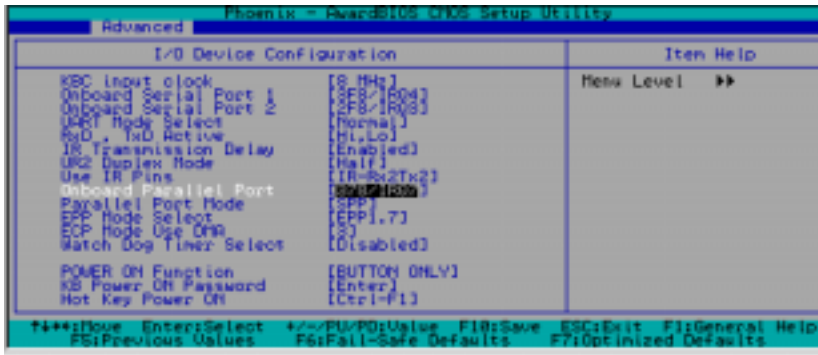
This setting allows you to enable or disable the functions of USB, Keyboard/ Mouse under POST and DOS. The options are **Disabled**, and Enabled.

CPU THRM-Throttling

THRM throttling is used to lower power consumption and reduce the heat generated by the CPU. The options for this setting are "87.5%", **"75%"**, "62.5%", "50%", "37.5%", "25%' and "12.5%".

7-4.3 I/O Device Configuration

Choose I/O Device Configuration from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:


Phoenix - AwardBIOS CMOS Setup Utility
Advanced
I/O Device Configuration
Item Help
KBC input clock [8 MHz]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
UART Mode Select [Normal]
RxD , TxD Active [Hi,Lo]
IR Transmission Delay [Enabled]
UR2 Duplex Mode [Half]
Use IR Pins [IR-Rx2Tx2]
Onboard Parallel Port
Parallel Port Mode [ECP]
EPP Mode Select [EPP1.7]
ECP Mode Use DMA [3]
Watch Dog Timer Select [Disabled]
POWER ON Function [BUTTON ONLY]
KB Power ON Password [Enter]
Hot Key Power ON [Ctrl-F1]
Menu Level ▸▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Keyboard Input Clock

This setting allows to you set the speed of the keyboard. The options are 6 MHz, **8 MHz,** 12 MHz, and 16 MHz.

Onboard Serial Port1/Onboard Serial Port2

This setting allows the user to set the address and the corresponding IRQ for the Serial Port1 and Serial Port 2. The options are "Disabled" , "3F8/ IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3", and "Auto". The default setting for Serial Port1 is "**3F8/IRQ4**" and the default for Port 2 is "**2F8/IRQ3**".

UART Mode Select

This setting allows the user to select the UART mode for the BIOS. The options are "IrDA", "ASKIR" and "**Normal**".

RxD, TxD Active

This allows the user to change the settings for the "RxD, TxD Active" function. The options are "Hi, Hi", "**Hi, Lo**", "Lo, Hi", and "Lo, Lo".

IR Transmission Delay

If "Enabled", the transmission of IR (infrared) signals will be delayed. The options are "**Enabled**" and "Disabled".

UR2 Duplex Mode

This setting set the mode for the UR2 Duplex Mode. The options are "Full" and "**Half**".

Use IR Pins

This item sets the usage of the IR pins. The options are "RxD2, TxD2" and "**IR-Rx2Tx2**".

Onboard Parallel Port

This setting allows the user to set the address and the corresponding IRQ for the onboard parallel port. The options are "Disabled", "**378/IRQ7**", "278/IRQ5" and "3BC/IRQ7".

Parallel Port Mode

This setting sets the mode for the onboard Parallel port. The options are "**SPP**," "EPP", "ECP" "ECP+EPP" and "Normal".

EPP Mode Select

This setting allows the user to select the EPP port type. The options are "EPP 1.9" and "**EPP 1.7**".

ECP Mode Use DMA

This setting allows the user to select the DMA channel for the ECP mode (port) to use. The options are "1" and "**3**".

Watch Dog Timer Select

This setting allows you to select the setting for the Watch Dog Timer. The Options are "**Disabled**", "10 Sec", "20 Sec", "30 Sec", "40 Sec", "I min", "2 min",and "4 min".

Power On Function

This setting allows the user to decide which method to use to power on the system. The options are "Password", "Hot Key", "Mouse Left", "Mouse Right", "Any Key", and "**Button Only**".

KB Power On Password

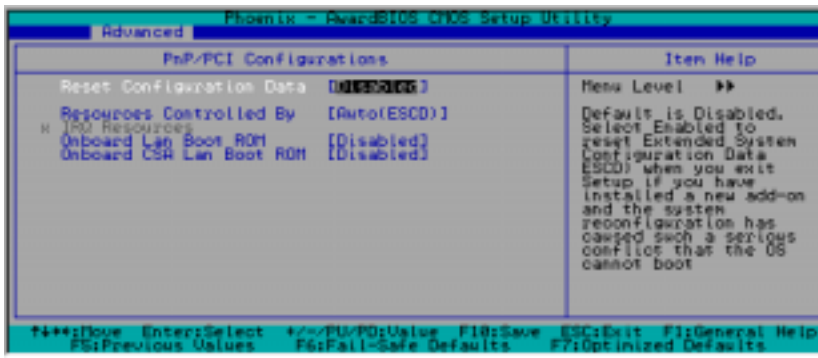
This setting allows the user to enter the Password when the system is powered on via keyboard.

Hot Key Power On

This setting allows the user to decide which hot-keys to use in order to power on the system. The options are "**Ctrl-F1**", "Ctrl-F2, Ctrl-F3", "Ctrl-F4", "Ctrl-F5", "Ctrl-F6", "Ctrl-F7", "Ctrl-F8", "Ctrl-F9", "Ctrl-F10", "Ctrl-F11" and "Ctrl-F8".

7-4.4 PnP Configuration

Choose PCI/PnP Configurations from the Award BIOS main menu with the Left/ Right arrow keys. You should see the following display:


Phoenix - AwardBIOS CMOS Setup Utility
Advanced
PnP/PCI Configurations
Item Help
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
IRQ Resources
Onboard Lan Boot ROM [Disabled]
Onboard CSA Lan Boot ROM [Disabled]
Menu Level ▸▸
Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Reset Configuration Data

Enabling this setting resets the extended system configuration data when you exit setup. Do this when you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot reboot the system. The options are "Enabled" and "**Disabled**".

Resources Controlled By

This setting allows BIOS to automatically configure all boot and Plug and Play compatible devices. If you choose Auto, you cannot select the IRQ, DMA and memory base address fields because BIOS automatically assigns them. The options are "**Auto <ESCD>**" and "Manual".

Onboard CSA LAN Boot

Select "Enabled" to enable the Boot ROM embedded in the Onboard CSA LAN Chip. The options are: "Enabled" and "**Disabled**".

7-4.5 Console Redirection

Choose Console Redirection from the Award BIOS main menu with the Left/ Right arrow keys. You should see the following display:

Phoenix - AwardBIOS CMOS Setup Utility
Advanced
Console Redirection
Item Help
Console Redirection [Disabled]
Baud Rate [9600]
Agent Connect via [NULL]
Agent wait time(min) [1]
Agent after boot [Disabled]
Menu Level ▸▸
Enabled - Attempt to redirect console via COM port
Disabled - Attempt to redirect console when keyboard absent
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Console Redirection

Select "Enabled" to redirect Console via COM Port. Select "Disabled" to redirect Console when the keyboard is absent. The options are: "Enabled" and "**Disabled**".

Agent Connect Via

This feature allows the user to set the connection mode for Console Redirection. When "Null" is entered, Console Redirection will be set to direct connection.

Agent Wait Time

This feature allows the user to set the timeout for the connection. The options are "1 (Min)", "**2 (Min)**", "4 (Min)" and "8 (Min)".

Agent after Boot

Select "Disabled" to allows the Agent of Console Redirection to continue running after OS bootup. The Options are "Enabled", and "**Disabled**".

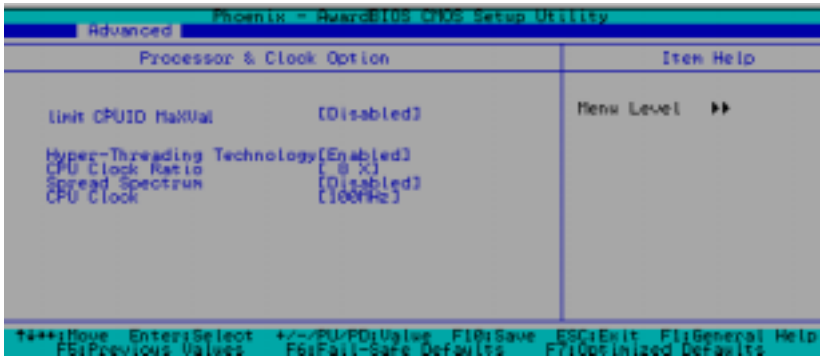
7-4.6 Hardware Monitor

Choose Hardware Monitor from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

CPU Warning Temperature

This allows you to set the CPU warning temperature. If the CPU temperature reaches this threshold, an alarm will activate and a warning message will be displayed onscreen. The options are "Disabled", "60° C/140° F", "65° C/149° F", "70° C/158° F", "**75° C/167° F**", "80° C/176° F" and "85° C/185° F".

7-4.7 Processor & Clock Options


Phoenix - AwardBIOS CMOS Setup Utility
Advanced
Processor & Clock Option
Item Help
Limit CPUID MaxVal [Disabled]
Menu Level ▸▸
Hyper-Threading Technology [Enabled]
CPU Clock Ratio [8 X]
Spread Spectrum [Disabled]
CPU Clock [100MHz]
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Limit CPUID MaxVal

This feature allows the user to set the limit for the CPUID Maximum Value. The value can be set from 1 to 3. The options are "Enabled" and **"Disabled"**. (*For Windows XP, the option should be set to "Disabled.")

Hyper-Threading Technology

Select "Enabled" to activate the hyper-threading function of the CPUs to make each CPU appear as if there were two CPUs to any programs that support it (you must have OS support also). The settings are "Disabled" and "**Enabled**."

CPU Clock Ratio

Key in a number between 8x to 50x to set the clock ratio of the processor. The default setting is **8x.** (*8x is only available for retail CPUs.)

Spread Spectrum

Spread Spectrum is a technique used to stablize a system by reducing the level of ElectroMagnetic Interference. The options are "Enabled" and "**Disabled**".

CPU Clock

Key in a number between 100 and 233 to set the CPU clock (MHz). Supermicro does not recommend or make any guarantees with CPU overclocking. The default setting is **"200 MHz"**.

7-5 Security

Choose Security from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

Phoenix - AwardBIOS CMOS Setup Utility
Main Advanced Security Boot Exit
Set Supervisor Password
Set User Password
Password Check [Setup]
Item Help
Menu Level ▶
Change/Set/Disable Password
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the Supervisor Password in the dialogue box to set or to change the Supervisor Password.

Set User Password

When the item "Set User Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the User Password in the dialogue box to set or to change the User Password.

Password Check

This setting allows the user to determine if the password is required every time when the system boots up or if the password is required only when you enter the CMOS setup. The options are "System" and "**Setup**".

7-6 Boot

Choose Boot from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

Phoenix - AwardBIOS CMOS Setup Utility
Main Advanced Security Boot Exit
Removable Device Priority
Hard Disk Boot Priority
CDROM Boot Priority
First Boot Device [CDROM]
Second Boot Device [Removable]
Third Boot Device [Hard Disk]
Boot Other Device [Enabled]
Item Help
Menu Level ▶
Select Hard Disk Boot Device Priority
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optinized Defaults

▶Removable Device Priority

This setting allows you to set the priority of removable devices. The options are **"Floppy Disks"**, "LS120", "Zip 100", "USB-FDD0", "USB-FDD1", "USB-ZIP0", and "USB-ZIP1".

▶ CD ROM Drives Boot Priority

This item allows the user to specify the boot sequence of the available CD ROM Devices.

▶ Hard Disk Boot Priority

This item allows the user to select the Boot Priority of the following Hard Disk Devices.

First Boot Device

This item allows the user to set the first boot-up device. The options are "Removable", "Hard Disks", "**CDROM**", "Legacy LAN", and "Disabled".

Second Boot Device

This item allows the user to set the second boot-up device. The options are **"Removable"**, "Hard Disks", "CDROM", "Legacy LAN", and "Disabled".

Third Boot Device

This item allows the user to set the Third boot-up device. The options are "Removable", "**Hard Disks**", "CDROM", "Legacy LAN", and "Disabled".

Boot Other Device

If enabled, this option enables the BIOS to load the OS from another device rather than the ones that have been specified as the first, second and third boot up devices. The settings are "**Enabled**" and "Disabled".

7-7 Exit

Choose Exit from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

Save & Exit Setup

When the item "Save & Exit Setup" is highlighted, press <Enter> to save the changes you've made in the BIOS program (CMOS) and exit. Your system should, then, continue with the boot-up procedure.

Exit without Saving

When the item "Exit without Saving" is highlighted, press <Enter> to exit the Setup routine without saving any changes you may have made. Your system should then continue with the boot-up procedure.

Load Fail-Safe Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Load Optimized Defaults

Highlight this item and hit <Enter> to load the optimized settings for all items in the BIOS Setup. These settings provide you with optimal system performance.

Discard Changes

When the item "Discard Changes" is highlighted, press <Enter> to discard any changes you made to the BIOS settings and to stay in BIOS Setup. Your system should then continue with the boot-up procedure.

Appendix A
BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Beeps	Error Message
1 long beep	Memory Modules Errors
1 long beep+2 short beeps	VGA Errors

Notes

Appendix B
BIOS POST Codes

This section lists the POST (Power On Self Testing) Codes for the Award BIOS.

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	● Disable PS/2 mouse interface (optional). ● Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). ● Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.

POST (hex)	Description
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	• Program CPU internal MTRR (P6 & PII) for 0-640K memory address. • Initialize the APIC for Pentium class CPU. • Program early chipset according to CMOS setup. Example: onboard IDE controller. • Measure CPU speed. • Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved

POST (hex)	Description
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.

POST (hex)	Description
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”.
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.

POST (hex)	Description
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text font used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

Notes

Appendix C

Software Installation

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID driver before you install the operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard.

C-1 Introduction to Serial ATA

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports transfer rates from 150 MB/s. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems can be installed in smaller chassis than PATA. In addition, PATA cables can only extend to 40cm, while SATA cables can extend up to one meter. Overall, SATA provides better functionality than PATA.

Intel 6300ESB I/O Controller Hub

Located in the South Bridge of Intel's E7210 chipset, the 6300ESB I/O Controller Hub provides the I/O subsystem with access to the rest of the system. In addition to supporting a dual-channel Ultra ATA/100 Bus Master IDE controller (PATA), the 6300ESB also supports two SATA host controllers, which provides support for up to two SATA ports and up to two RAID drives. The 6300ESB supports the PATA and SATA device configurations listed below.

ATA Operating Modes

You can select from the following two modes: Combined Mode and Enhanced Mode.

Combined Mode

In this mode, system BIOS assigns the traditional IRQ 14 and IRQ 15 for HDD use. Up to four ATA devices are supported by this mode.

Within the Combined Mode, the following three modes are supported:

Non-Combined Mode: Parallel ATA only, with a maximum of four devices supported.

Non-Combined Mode: SATA only, with a maximum of two devices supported.

Combined Mode: SATA and PATA devices, with support for two devices of each for a total of four devices maximum. For IDE(PATA)/SATA configurations, please refer to the table below.

Primary Master(=PM)	Yes	Yes	No	No	No	No
Primary Slave(=PS)	Yes	No	Yes	No	No	No
Secondary Master(=SM)	Yes	No	No	Yes	No	No
Secondary Slave(=SS)	Yes	No	No	No	Yes	No
SATA Port0	No	SM	SM	PM	PM	PM
SATA Port1	No	SS	SS	PS	PS	PS
*Note: (No=Not Present, Yes=Present) Also, if Logical Primary is selected, the IDE channels are no longer available.						

Enhanced Mode

In this mode, system BIOS will automatically search for all available IRQs for HDD use. For newer operating systems that support Enhanced Mode (such as WindowsXP, Windows2000 and Windows2003), you can set SATA and PATA to the Enhanced Mode. (These newer operating systems can accommodate both Enhanced and Combined Modes and support up to six ATA devices.)

Please refer to "Advanced Chipset Control" under the "Advanced" setup section in BIOS to select Combined Mode or Enhanced Mode.

C-2 Intel Hance Rapids Driver Installation

a. Insert Supermicro's bootable CD that came with the server into the CD drive and restart the system. Upon reboot, a screen entitled "Super Micro Driver Diskette Maker" will appear.

b. Choose from the list the item: "Intel Hance Rapids Driver by 3rd Party (Adaptec)" and press <Enter>.

c. On the next screen displayed, choose the OS driver you want to install and press <Enter>.

d. Insert a formatted diskette into floppy (A drive) and press <Enter> as prompted.

e. Exit the program after the process is completed. Then, reboot the system.

f. Insert a Microsoft Windows OS Setup CD in the CD Driver, and the system will start to boot up from the CD.

g. Press the <F6> key when the message-"Press F6 if you need to install a third party SCSI or RAID driver" displays.

h. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

i. Insert the driver diskette named "Adaptec Embedded Serial ATA Raid Controller Driver" into drive A: and press the <Enter> key.

j. Choose **Adaptec Embedded Host Serial ATA Raid Controller** from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

k. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

l. From the Windows OS Setup screen, press the <Enter> key. The OS Setup will automatically load all device files and then continue the Windows OS installation.

m. After the Windows OS Installation is completed, the system will automatically reboot.

C-3 Other Software Programs and Drivers

After you've installed Windows Operating System, the screen shown below will appear. You are now ready to install the additional software programs and drivers included on the CD. To install these software programs and drivers, click the icons to the right of these items.

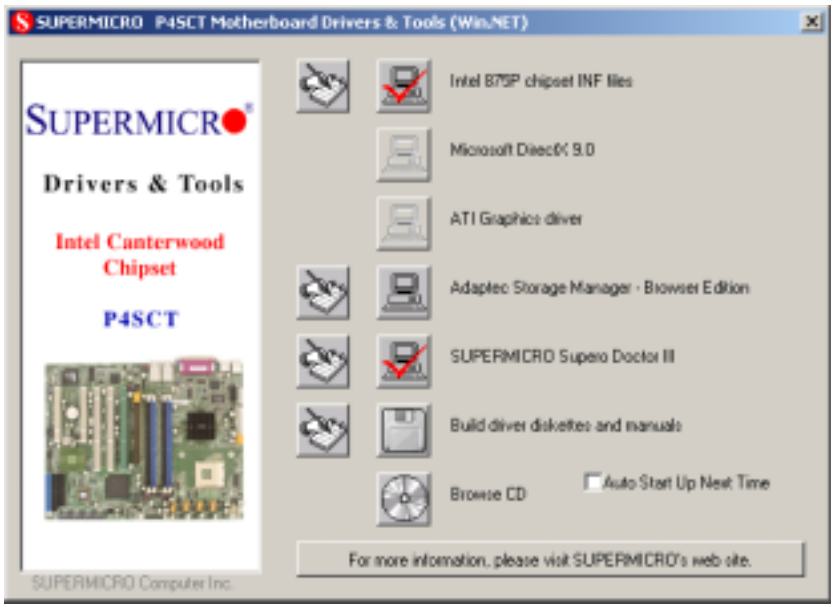


Figure C-1. Driver/Tool Installation Screen

You may also click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, which is optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Figure C-2. Supero Doctor III Interface Display (Health Information)

Note: For Linux, we recommend using Supero Doctor II.

Notes

Appendix D
System Specifications

Processors
Single Intel® Pentium® 4 processor of up to 3.40 GHz with HT technology (processors must be 0.09 or 0.13 micron technology) or Intel® Celeron® processors of up to 2.80 GHz at a 800/533/400 MHz front side bus speed

Chipset
Intel E7210

Memory Capacity
Four (4) DIMM slots to support a maximum of 4 GB ECC unbuffered DDR400/333 low-profile SDRAM (dual-channel memory)

DIMM Sizes
128 MB / 256 MB / 512 MB / 1 GB 184-pin modules supported

Operating Systems Supported
Windows NT, Windows 2000, Solaris, Netware, SCO UNIX and Linux

Serial ATA Controller
6300ESB controller hub incorporated into chipset

Serial ATA Backplane
SATA backplane (CSE-SATA-813) for four (4) SATA drives

Main Drive Bays
Four (4) drive bays to house four (4) standard 1" SATA drives

Peripheral Bays
One (1) slim CD-ROM drive

PCI Expansion Slots
One (1) 64-bit 66 MHz (3.3V) PCI-X slot (bundled with a riser card)

Motherboard
Model: P4SCT+ (ATX Form Factor)
Dimensions: 12 x 9.5 in (305 x 241 mm)

Chassis
Model: SC813MT-300C (1U Rackmount)
Dimensions: (WxHxD) 17.2 x 1.7 x 19.85 in. (437 x 43 x 504 mm)

Weight
Gross Weight: 38 lbs. (17.3 kg.)

System Cooling
Three (3) 4-cm high performance fans (FAN-0061)

System Input Requirements
AC Input Voltage: 100-240 VAC
Rated Input Current: 5A (115V) to 2A (230V)
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 300W (Model# SP302-1S, Part# PWS-0054)
Rated Output Voltages: +3.3V (15A), +5V (15A), +12V1 (15A), +12V2 (15A), 12Vtotal (20A), -12V (1A), +5Vsb (2A)

BTU Rating
1470 BTUs/hr (for rated output power of 300W)

Operating Environment
Operating Temperature: 10º to 35º C (50º to 90º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)